



Hold the phone: Blackfoot telephone automates directory assistance.

Rural Telecommunications January 2004, 2004

"Blackfoot Directory Assistance. City and state, please?"
"Missoula, Montana."
"Are you looking for a business, government or residential listing?"
"Residential, please."
"What listing?"

Although the conversation sounds ordinary, this customer of Blackfoot Telecommunications in Missoula, Mont., isn't speaking with a live operator. Blackfoot's new speech-recognition system is helping directory assistance customers find the information they need, without ever contacting an operator or pressing a touchtone keypad.

Blackfoot installed its automated system last February. After starting with business and government listings, it quickly expanded the service to include residential. Today, Blackfoot's 30,000 customers, both wireless and wireline, always reach an automated operator when they dial 411. The system provides listings to about 58% of callers and transfers the rest to live operators at an outsourced facility.

[ILLUSTRATION OMITTED]

This rate of success reflects years of research into speech recognition. In general, speech recognition software has become better at filtering out ambient noise and nonessential words. Many companies now use speech recognition to automate transactions ranging from, "Where's the store closest to me?" to "Move \$100 from savings to checking."

But directory assistance has its own special challenges. For example, the system has to know that even though a listing reads "Parker, Mark J. M.D.," the customer is likely to ask for "Doctor Mark Parker."

In the 42% of inquiries that Blackfoot can't automate, callers who don't hang

up are transferred to operators. In a transfer, the system "whispers" the customer's information to the operator so the caller doesn't have to repeat his request.

Conversations with Blackfoot's automated operator can become surprisingly complex. A customer who requests a common name may be told, "I have two listings for Bill Williams in that city. One is on Washington Street, and the other is on Lafayette Street. Which one do you want?" When the caller answers, "The one on Lafayette Street," he'll receive the phone number for the second listing.

Answering the Call

Partly automated directory assistance has been available for about a decade, and a variety of systems exist today. A live operator may take the call and retrieve the listing, which then is read out by a text-to-speech application. In "store-and-forward" systems, a recorded message greets and prompts the customer; the system records the customer's information and forwards it to an operator. In some store-and-forward systems, speech recognition is used to interpret city and state, and a partially completed search query is passed to the operator.

A second generation of systems eliminated the operator altogether for frequently used listings, such as the local police precinct or the neighborhood pizza parlor. Typically, less than 10% of directory assistance requests fall into the frequently used category.

Today's newest systems use speech recognition software to interpret the entire contents of every directory assistance request. Blackfoot's system is provided by Telelogue, an Iselin, N.J.-based company. According to Mary Luvera, product management director, Telelogue is the only company providing a fully automated directory assistance system for all 50 states, and the only one whose system is deployed to small carriers.

While only a handful of independent phone companies have deployed automated directory assistance so far, the numbers may grow soon. According to Mike Bird, vice president for telecom sales at Operator Service Co. (OSC), which resells Telelogue's system, interest is keen and orders are flooding in. "It's just starting to snowball," Bird said. He estimated that by the end of 2004, between 40% and 50% of incumbent local exchange carriers (ILECs) will be using automated systems.

The primary selling point, Bird said, is the cost savings yielded by automated directory assistance. This bears out at Blackfoot. Michelle Rush, a regulatory specialist, said Blackfoot's automated calls cost about 40% less than the calls handled by live operators. The system even reduces the cost of live-agent calls,

since passing information to the operator shortens the average call length.

Market Differentiation

Small telephone companies are interested in differentiating themselves in the marketplace and providing services that are popular with customers. And the service does appear to be popular. At Blackfoot, the number of directory assistance requests has jumped by approximately 50%, despite an increase in price for the service. (Some of the increase also may be attributable to the simultaneous introduction of a call-completion service, in which the system asks if the customer wants the requested number dialed and does so when the caller presses 1.)

Out of 60,000 or more calls placed to directory assistance since the system went live, Blackfoot's Rush said only 15 customers have voiced complaints. Most of the complaints came from customers who were calling from very noisy locations or speakerphones, where the speech recognition system couldn't distinguish the caller's words from the ambient noise.

Rather than maintain the system on its own premises, Blackfoot opted for a hosted solution, where the vendor is responsible for the hardware and software. Rush said, "Telelogue is focused on directory assistance--they're the experts on that. We don't have the expertise or the resources to have this system on premises." Luvera added that most small carriers don't find it cost-effective to build systems in their own networks.

With a hosted solution, the technical aspect of the project is simple from the carrier's point of view--just a matter of switching traffic from one vendor to another, according to Rush. But there still is logistical work to be done.

Getting It Right

Before implementation, Blackfoot created phonetic spellings for all Montana cities and many local businesses. In many cases, they came up with two spellings for each city, one reflecting the way locals pronounced the name and the other reflecting the way outsiders might pronounce it. "It was time consuming," Rush recalled, "but the effort up front increased the automated rate right at the beginning."

After the cutover, the vendor took over to fine-tune the system. Staff continually analyzes calls that are passed to live operators and decides whether alternative phonetic spellings might increase the answer rate. In addition, they change the user interface if they think customers will respond better to different wordings or call flows. "We're constantly looking at data and refining the system," Luvera said.

The results also improved as customers became familiar with the system, Rush added. At first, customers didn't always know they were speaking to an automated system; when they realized that they were, they sometimes became flustered and hung up or asked for the operator.

Other customers, Rush said, had heard about the system and just called to check it out, hanging up before they got an answer. Blackfoot changed the wording to identify the system as automated, and its customers have grown used to the idea of talking to a computer.

Pushing the Limits

Reflecting on her experience with the automated system, Rush stressed the importance of managers, customer support staff, and even customers having realistic expectations.

Management should understand from the beginning that automated directory assistance will never answer 100% of inquiries. In some cases, if the customer doesn't know the city, or is mistaken about the city, a live operator can help by expanding the search to nearby towns.

Sometimes a listing doesn't exist at all, and the request fails even when it is transferred to an operator. And sometimes too many listings match the customer's information. According to Luvera, Telelogue allows each phone company to customize the length of the allowable list, but it's a fair bet that no company would ask the automated system to read out all 46 listings for John Smith in New York City.

Other calls might be automated in the future, but can't be handled by today's systems, Rush said. For example, some of Blackfoot's customers push the limits of automated directory assistance by trying to use it as a kind of Yellow Pages, asking for "motel" and expecting to get a list of all motels in a city. Other customers would like to do reverse lookups, where they give the telephone number and get the listing.

Customer service agents also need to know what to expect. Rush recommended training them before the system goes live, so they are prepared to respond to customers' concerns. And customers, too, need to be prepared by being warned that they are talking to an automated system.

Despite these cautions, Rush concluded, "Our six-month experience has been outstanding, and the service has performed better than we projected." Blackfoot is planning enhancements to the system, including eliminating the touchtone confirmation for call completion (pressing 1 instead of saying yes)--

an annoyance for wireless users--and adding reverse lookup capabilities, which will be ready this year.

In fact, Rush is so pleased with the system that she's already thinking about other ways to apply speech recognition technology. Routing calls for nondirectory assistance to sales, customer assistance, repairs, etc., based on what they say, seems like an intriguing possibility. "I'm going to seriously look at it," she said.

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